pilot burner 92. Once the pilot burner ignition is established and spark generators turned off and the flame sensor senses a pilot flame and the main gas valve opens 80, the main burners 76 will establish full ignition. The control module 52 will maintain the boiler 50 in operation until the sensor 128 is satisfied, then the three-way valve 66 will move back to the position via the actuator 158 to transfer boiler water from pipe 74 to pipe 156.

[0037] A difference between the space heating and the DHW heating operation sequences is that the DHW heat call requires that the three-way valve 66 changes positions and does not allow the system boiler water to go through the heat circuit, but rather utilizes all of the boiler thermal capacity to supply as much heat as possible to generating DHW.

[0038] The many features and advantages of the invention are apparent from the detailed specification, and thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true spirit and scope of the invention. Further, since numerous modifications and variations will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed is:

1. A boiler for providing a hot fluid comprising:

a first heat exchanger configured to exchange heat between at least one first fluid and a heat source and having a first cold fluid intake configured to inlet the first fluid into the first heat exchanger and a first hot fluid outlet configured to outlet the first fluid from the first heat exchanger;

a second heat exchanger configured as at least part of the first heat exchanger and configured to exchange heat between the first and a second fluid and having a second cold fluid intake configured to inlet the second fluid into the second heat exchanger and a second hot fluid outlet configured to outlet the second fluid from the second heat exchanger; and

a three way valve configured to selectively divert fluid from at least one of the first hot fluid outlet and a circuit to the first cold fluid intake, and

wherein the three way valve also provides fluid to the first cold fluid intake from at least one of a fluid source, directly from the first hot fluid outlet, and fluid that has circulated through the circuit.

2. The boiler of claim 1, further comprising a sensor configured to sense a temperature associated with the second hot fluid outlet and send a signal to a controller when the temperature associated with the second hot fluid outlet is below a predetermined level, and

wherein the controller operates the three way valve to divert at least some fluid from the first hot fluid outlet to the first cold fluid inlet.

3. The boiler of claim 2, wherein the sensor is further configured to send a signal to the controller when the temperature associated with the second hot fluid outlet is above a predetermined level, and

wherein the controller shuts down heating elements in the boiler.

4. The boiler of claim 1, wherein the boiler is gas fired.

5. The boiler of claim 1, further comprising a sensor configured to sense a temperature associated with the first fluid in the first heat exchanger and send a signal to the controller when the temperature associated with the first fluid in the first heat exchanger is above a predetermined level, and

wherein the controller shuts down heating elements in the boiler.

6. The boiler of claim 1, wherein fluid exiting the first hot fluid outlet circulates selectively in one of a circuit to provide residential building heat and a bypass for the circuit and is applied directly back to the first heat exchanger via the first cold fluid inlet.

7. The boiler of claim 1, wherein fluid exiting the second hot fluid outlet is domestic hot water and the fluid applied to the second heat exchanger via the second cold fluid input comes from a municipal water source.

8. A boiler for providing a hot fluid comprising:

a first heat exchanger configured to exchange heat between at least one first fluid and a heat source having a first cold fluid intake configured to inlet the first fluid into the first heat exchanger and a first hot fluid outlet configured to outlet the first fluid from the first heat exchanger;

a second heat exchanger configured as at least part of the first heat exchanger and configured to exchange heat between the first and a second fluid, the second heat exchanger having a second cold fluid intake configured to inlet the second fluid into the second heat exchanger and a second hot fluid outlet configured to outlet the second fluid from the second heat exchanger; and

means for selectively diverting fluid from the first hot fluid outlet to at least one of the first cold fluid intake and a circuit, and

wherein the means for diverting fluid provides fluid to the first cold fluid intake from at least one of a fluid source, directly from the first hot fluid outlet, and fluid that has circulated through the circuit.

9. The boiler of claim 8, further comprising a sensor configured to sense a temperature associated with the second hot fluid outlet and send a signal to a controller when the temperature associated with the second hot fluid outlet is below a predetermined level, and

wherein the controller operates the means for diverting fluid to divert at least some fluid from the first hot fluid outlet to the first cold fluid inlet.

10. The boiler of claim 9, wherein the sensor is further configured to send a signal to the controller when the temperature associated with the second hot fluid outlet is above a predetermined level, and

wherein the controller operates means for diverting fluid to provide fluid to the first cold fluid inlet from at least one of a fluid source and fluid that has circulated through a circuit.

11. The boiler of claim 8, wherein the boiler is gas-fired.

12. The boiler of claim 8, further comprising a sensor configured to sense a temperature associated with the first fluid in the first heat exchanger and send a signal to the controller when a temperature associated with the first fluid in the first heat exchanger is above a predetermined level, and

wherein the controller turns off heating elements associated with the boiler.

13. The boiler of claim 8, wherein fluid exiting the first hot fluid outlet circulates selectively in one of a circuit to provide residential building heat and a bypass for the circuit and is applied directly back to the first heat exchanger via the first cold fluid inlet.

14. The boiler of claim 8, wherein fluid exiting the second hot fluid outlet is domestic hot water and the fluid applied to the second heat exchanger via

the second cold fluid input comes from a municipal water source.

15. A method of exchanging heat between two fluids comprising:

flowing a first and second fluid through a heat exchanger;

directing the first fluid back through the heat exchanger when a controller detects a need to provide the second fluid; and

directing the first fluid through a circuit where a substantial portion of its heat is removed from the first fluid and then routing the first fluid back to the heat exchanger when the controller detects a need for hot fluid in the circuit.

16. The method of claim 15, further comprising:

detecting a temperature associated with the second fluid leaving the heat exchanger;

directing the first fluid back through the heat exchanger when the controller detects the temperature of the second fluid leaving the heat exchanger is below a predetermined level.

17. The method of claim 15, further comprising:

detecting a temperature associated with the first fluid in the heat exchanger; and

shutting off heating elements when the temperature associated with the first fluid in the heat exchanger is above a predetermined level.

18. The method of claim 15, wherein the circuit is configured to provide indoor heating.

19. The method claim 15, wherein the second fluid is heated for use as domestic hot water.

20. The method of claim 15, wherein the first and second fluid are heated in the heat exchanger by a third fluid.